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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/190,208      | 11/13/1998  | JIASHU CHEN          | CHEN3-1             | 6397             |

7590 09/24/2002

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EXAMINER

LAO, LUN S

| ART UNIT | PAPER NUMBER |
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2643

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/190,208

Applicant(s)

CHEN ET AL.

Examiner

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

### *Introduction*

1. Claims 1-14 remain pending. This action is in response to the amendment filed 7/12/2002. Applicant has amended claim 1.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata (US PAT. 5,974,154) in view of Matsumoto (US PAT. 5,381,482).

Regarding claim 1, Nagata teaches a digital delay line for use in a 3D audio sound system, comprising:

a first delay module (see fig.2, 61) providing a choice (see fig.10) of delay within a first resolution; and

a second delay module (see fig.2, 71) in series with said first delay module, said second delay module providing a choice (see fig.10) of a plurality of additional delays.

(col. 4, line 42 – col. 5, line 44).

While Nagata teaches that the additional delay produced by the second delay module can be set to provide a range of delays by adjusting the state of switch matrix 45, the dials 41,48 and 49 and the command switch 50 (see col.5 line 22 - col.6 line 6), Nagata does not explicitly teach that the additional delays produced include one which is a fraction of / less than the first resolution/delay.

Matsumoto teaches a digital delay line for use in a 3D audio sound system (fig. 4), wherein a second delay module (#32, 33) produces an additional delay (0.7ms) which is a fraction of / less than a first delay (20ms) produced by a first delay module (#40) in series. See col. 9, line 15 – col. 10, line 55. Given the teaching of Matsumoto, it would have been obvious to set the additional delay produced by the second delay module in Nagata to a value which is a fraction of / less than the first resolution/delay. In so doing, the sound would have appeared more naturally (Matsumoto, col. 1, lines 45-52).

Regarding claims 2, 3, Nagata discloses that the digital delay line for use in a 3D audio sound system includes first delay module a first-in, first out buffer (see fig.2, TD1-TDn)); and has a choice of any one of a plurality of polyphase filters (see fig.8, 921), each of said polyphase filters providing an additional fraction delay less than said first resolution (It has a chance by adjusting the state of switch matrix 45,the dials 41,48 and 49 and the command switch 50 and see col.4 line 60-col.5 line 67).

Regarding claims 4, 5, Nagata teaches that the digital delay line for use in a 3D audio sound system includes a localization control module comprising an interaural time

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delay look-up table associating desired sound source locations with a particular interaural time delay (see col.6 lines 7-42); and integer (see fig.2, 61) and fractional (see fig.2, 71) delay selector adapted to determine a first time delay for use by said first delay module and said additional fractional delay for use by said second delay module (see col.4 line 60-col.5 line67).

Regarding claim 6, Nagata teaches that the digital delay line for use in a 3D audio sound system includes first resolution is based on a sampling rate of a digital audio signal (see fig.2, (TD1, TD2....TDn)).

Regarding claim 11, Nagata teaches that apparatus for providing an interaural time delay in a digital 3D sound system, comprising:

means for selecting one of a plurality of available first time delays (see fig.2, 61)) having a first resolution between each of said plurality of available first time delays;

means for additionally selecting one of a plurality of available second time delays (see fig.2, 71), and

means for adding (see fig.2, (72l, 72R)) said selected first time delay and said second time delay to provide a desired interaural time delay.

As to each of the plurality of available second time delays being less than the first resolution, this is met by the combination of Nagata and Matsumoto. Note the rejection of claim 1 for a detailed discussion. Note the rejection of claim 1 for a motivation to combine.

Regarding claims 12, 13, Nagata teaches that the apparatus for providing an interaural time delay in a digital 3D sound system of desired interaural time delay

relates to a desired interaural time delay (see fig.2, (61,71)) for one ear of a listener (see fig.2, (72L or 72R)); and said first time delay (see fig.2, 61) relates to a desired interaural time delay for a second ear of said listener (see fig.2, (72L or 72R)); and the plurality of available time delays are based on a sampling rate of a digital audio signal (see fig.2,(TD1,TD2....TDn).

Regarding claim 14, Nagata teaches that the apparatus for providing an interaural time delay in a digital 3D sound system comprises:

means for fixing (41 independently) a first interaural time delay (fig.2, 61) with respect to a first ear of a listener (see fig.2 (74R or 74L)); and

means for providing said -desired interaural time delay (see fig.2, 71) with respect to a second ear (see fig.2 (74R or 74L)) of said listener.

As to claims 7-10, these are method claims of claims 11-14, respectively. Thus note claims 11-14, respectively, for rejection.

### ***Response to arguments***

4. Applicant's arguments filed 7/12/2002 have been considered, but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered to applicant's disclosure. Fujimori (US PAT. 6,026,169) is recited to show other related the method and apparatus for processing interaural time delay in 3d digital audio.

6. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:(703) 872-9314

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington.

VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao, Lun-See  
Patent Examiner  
US Patent and Trademark Office  
Crystal Park 2  
(703305-2259)

  
CURTIS KUNTZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600